This listing of claims will replace all prior versions, and listings, of claims in the application:

The Status of the Claims

1. (Original) A disc valve system for a piston driven internal combustion engine, said disc valve system comprising:

at least one rotating disc for mounting between a cylinder head manifold comprising exhaust and intake ports and an engine cylinder housing the piston and defining a combustion chamber, said rotating disc comprising sequencing ports so configured as to be brought into periodic communication with said exhaust and intake ports at cyclic intervals of the rotating movement of said rotating disc thereby providing for said exhaust and intake ports to be brought into periodic communication with said combustion chamber; and

an intermediate seal member for mounting in the engine cylinder at a junction of said rotating disc and the engine cylinder so as to seal the combustion chamber, said intermediate seal member comprising a dynamic seal for contact with said rotating disc and a stationary seal for sealing contact with the engine cylinder;

whereby the rotating movement of said rotating disc sequentially opens and closes each said exhaust and intake ports synergistically with the translational movement of the piston

2. (Original) A disc valve system according to claim 1, wherein said disc comprises a generally central aperture for being in alignment with an aperture of the cylinder head manifold.

3. (Original) A disc valve system according to claim 2, wherein said cylinder head manifold aperture is defined by a spark-plug receiving portion.

4. (Original) A disc valve system according to claim 3, wherein said spark-plug receiving portion defines a threaded portion for fixedly receiving a spark-plug.

5. (Original) A disc valve system according to claim 2, wherein said cylinder head manifold aperture is defined by a fuel-injector receiving portion.

6. (Original) A disc valve system according to claim 5, wherein said fuel-injector receiving portion defines a threaded portion for fixedly receiving a fuel injector

7. (Original) A disc valve system according to claim 1, wherein said disc comprises an outer face in a slidable sealing relationship with the cylinder head manifold and an opposite inner face in a slidable relationship with said intermediate seal member.

8. (Original) A disc valve system according to claim 7, wherein said outer face comprises a generally central protrusion for slidably mating with a complementary indentation within the cylinder head manifold.

9. (Original) A disc valve system according to claim 8, wherein said generally central protrusion comprises a tubular shaft.

10. (Original) A disc valve system according to claim 9, wherein said tubular shaft defines an aperture for fixedly receiving a spark plug.

11. (Original) A disc valve system according to claim 9, wherein said tubular shaft defines an aperture for fixedly receiving a fuel injector.

12. (Original) A disc valve system according to claim 7, wherein said outer face comprises a generally circular protrusion for slidably mating with a complementary indentation comprised by the cylinder head manifold.

13. (Original) A disc valve system according to claim 12, wherein said complementary indentation is defined by a layer of material added on the cylinder head manifold.

14. (Original) A disc valve system according to claim 13, wherein said layer of material is selected from the group consisting of: copper and anti-friction material.

15. (Original) A disc valve system according to claim 12, wherein said complementary indentation is formed within the cylinder head manifold.

16. (Original) A disc valve system according to claim 7, wherein said inner face comprising a turbulator portion configured to provide for turbulence thereunder during the rotating movement of said disc.

17. (Original) A disc valve system according to claim 16, wherein turbulator portion further comprises propeller members.

18. (Original) A disc valve system according to claim 16, wherein said turbulator portion comprises a receding region within said inner face.

19. (Original) A disc valve system according to claim 18, wherein turbulator portion further comprises propeller members about said receding portion.

20. (Original) A disc valve system according to claim 19, wherein said propeller members comprise blade members.

21. (Original) A disc valve system according to claim 20, wherein said blade members are generally circular shaped.

22. (Original) A disc valve system according to claim 19, wherein said sequencing ports comprise apertures which through said propeller members.

23. (Original) A disc valve system according to claim 18, wherein said receding region is generally conical shaped.

24. (Original) A disc valve system according to claim 7, wherein said inner face comprises a skirt portion for mating with the engine cylinder.

25. (Original) A disc valve system according to claim 24, wherein said skirt portion and the cylinder engine comprise a sealing material therebetween.

26. (Original) A disc valve system according to claim 1, wherein said rotating disc comprises gear elements.

27. (Original) A disc valve system according to claim 26, wherein said gear elements comprise bevel teeth.

28. (Original) A disc valve system according to claim 26, wherein said rotating disc comprises an inner face comprising said gear elements.

29. (Original) A disc valve system according to claim 28, wherein said gear element is formed near the periphery of said rotating disc.

30. (Original) A disc valve system according to claim 1, wherein said cylinder head manifold and said disc comprise a sealing material therebetween.

31. (Original) A disc valve system according to claim 1, wherein said sequencing ports comprise at least one intake sequencing port and at least one exhaust sequencing port.

32. (Original) A disc valve system according to claim 1, wherein said sequencing ports comprise apertures.

33. (Original) A disc valve system according to claim 32, wherein said sequencing ports comprise respective shutter members.

34. (Original) A disc valve system according to claim 33, wherein said shutter are so biased as to at least keep said port apertures partially closed.

35. (Original) A disc valve system according to claim 34, wherein said shutters are moveable towards a position that progressively opens said port apertures during the rotating movement of said disc.

36. (Original) A disc valve system according to claim 35, wherein a said shutter comprises a moveable member positioned within said aperture, and mounted to a port wall via a biasing member.

37. (Original) A disc valve system according to claim 36, wherein said biasing member comprises a spring.

38. (Original) A disc valve system according to claim 33, wherein said shutters comprise flaps which are mounted to said disc via a biasing member so biasing said flaps as to at least substantially cover said sequencing port apertures.

39. (Original) A disc valve system according to claim 38, wherein said biasing member comprises spring.

40. (Original) A disc valve system according to claim 31, wherein during the rotating movement of said disc, said intake sequencing port is brought into periodic communication with said cylinder head intake port and said exhaust sequencing port is brought into periodic communication with said cylinder head exhaust port.

41. (Original) A disc valve system according to claim 40, wherein said at least one intake sequencing port and at least one exhaust sequencing port are moved by the rotating movement of said disc along a same orbital.

42. (Original) A disc valve system according to claim 40, wherein said at least one least one intake sequencing port and at least one exhaust sequencing port are moved by the rotating movement of said disc along different respective orbitals.

43. (Original) A disc valve system according to claim 1, wherein said sequencing ports comprise a plurality of intake sequencing ports and a plurality of exhaust sequencing ports.

44. (Original) A disc valve system according to claim 43, wherein said plurality of intake and exhaust sequencing ports are disposed in respective intake and exhaust series on said rotating disc.

45. (Original) A disc valve system according to claim 44, wherein said series of said plurality of intake sequencing ports comprises intake ports of different dimensions.

46. (Original) A disc valve system according to claim 45, wherein said plurality of intake sequencing ports comprises sequencing ports that increase in size in the direction from the centre of said disc to the periphery of said disc.

47. (Original) A disc valve system according to claim 44, wherein said series of said plurality of exhaust sequencing ports comprises exhaust ports of different dimensions.

48. (Original) A disc valve system according to claim 47, wherein said plurality of exhaust sequencing ports comprises sequencing ports that increase in size in the direction from the centre of said disc to the periphery of said disc.

49. (Original) A disc valve system according to claim 1, wherein the cylinder head manifold comprises liquid bearings on a portion thereof that is in contact with said disc.

50. (Original) A disc valve system according to claim 49, wherein said liquid bearings comprise channels formed within said cylinder head manifold portion.

51. (Original) A disc valve system according to claim 50, wherein said cylinder head manifold comprises a material plated on said portion, said liquid bearings comprising channels formed within said plated material.

52. (Original) A disc valve system according to claim 1, wherein said intermediate seal member comprises a top face, a bottom face and an outer surface therebetween, said top face being in contact with said rotating disc and providing for said disc to rotate with respect thereto.

53. (Original) A disc valve system according to claim 52, wherein said intermediate seal member comprises a ring member.

54. (Original) A disc valve system according to claim 52, wherein said outer surface comprises said stationary seal.

55. (Original) A disc valve system according to claim 54, wherein said stationary seal comprises a ring seal.

56. (Original) A disc valve system according to claim 54, wherein said stationary seal seals the internal periphery of the engine cylinder about an opening thereof leading to the combustion chamber.

57. (Original) A disc valve system according to claim 54, wherein said stationary seal extends beyond said seal member outer surface.

58. (Original) A disc valve system according to claim 54, wherein said stationary seal is slidably mounted on said outer surface

59. (Original) A disc valve system according to claim 54, wherein said outer surface comprises a groove to hold said stationary seal.

60. (Original) A disc valve system according to claim 59, wherein said groove slidably holds said stationary seal.

61. (Original) A disc valve system according to claim 52, wherein said bottom face comprises at least one locking element to be mated with a complementary locking element of the engine cylinder.

62. (Original) A disc valve system according to claim 61, wherein at least one said bottom face locking element comprises a recess and said complementary engine cylinder locking element comprises a pin.

63. (Original) A disc valve system according to claim 62, wherein said recess is generally vertical with respect to said bottom face.

64. (Original) A disc valve system according to claim 62, wherein said recess is generally slanted with respect to said bottom face.

65. (Original) A disc valve system according to claim 52, wherein said bottom face comprises a configuration that is complementary to an inner top peripheral region of said cylinder.

66. (Original) A disc valve system according to claim 61, wherein said bottom face securely sits on said inner top peripheral region within the engine cylinder.

67. (Original) A disc valve system according to claim 1, further comprising a disc-rotator assembly for causing the rotational movement of said rotating disc.

68. (Original) A disc valve system according to claim 67, wherein said disc-rotator assembly comprises a transmission assembly, the piston-driven engine comprising a crankshaft mounted to the piston, said transmission assembly being configured to be put in operative communication with the crankshaft and with said rotating disc such that said disc rotates in relation to the revolution of the crankshaft thereby providing for said disc to sequentially open and close each said exhaust and intake ports synergistically with the revolution of the crankshaft.

69. (Original) A disc valve system according to claim 68, wherein said transmission assembly comprises a gear assembly, said disc comprising gear elements in operative communication with said gear assembly.

70. (Original) A disc valve system according to claim 69, wherein said gear elements comprise bevel teeth.

71. (Original) A disc valve system according to claim 69, wherein said gear assembly comprises a first gear in operative communication with said crankshaft, said first gear being in operative communication with a second gear, said second gear being in operative communication with said disc gear elements so as to transmit the movement of the crankshaft to said disc.

72. (Original) A disc valve system according to claim 71, wherein said first gear is mounted to said crankshaft.

73. (Original) A disc valve system according to claim 71, wherein said gear assembly further comprises a movement-transfer assembly in operative communication with both said first and second gears for transmitting the movement of said first gear to said second gear.

74. (Original) A disc valve system according to claim 72, wherein said first and second gears comprise first and second sprocket gears respectively, said movement-transfer assembly comprises a chain member mounted at one end to said first sprocket gear and at an opposite end to said second sprocket gear.

75. (Original) A disc valve system according to claim 74, further comprising a tension-assembly being in contact with said chain member as to apply tension thereto thereby interruptingly retarding the rotating movement of said disc at given intervals thereof.

76. (Original) A disc valve system according to claim 75, wherein said chain member defines two opposite chain sides between said first and second sprocket gears, said tension-assembly comprising tension elements mounted on said opposite chain sides.

77. (Original) A disc valve system according to claim 76, wherein said tension-assembly further comprises a dynamic member mounted to said tension elements.

78. (Original) A disc valve system according to claim 77, wherein said dynamic member is made of resilient material.

79. (Original) A disc valve system according to claim 77, wherein said tension-assembly comprises first and second opposite tension elements being mounted to a respective chain side, said dynamic member comprising an elongate member having said first and second tension elements mounted at each longitudinal end thereof.

80. (Original) A disc valve system according to claim 79, wherein said first and second tension elements are mounted to biasing members for being biased towards a respective said chain side.

81. (Original) A disc valve system according to claim 80, wherein said biasing members comprise tension springs.

82. (Original) A disc valve system according to claim 79, wherein said first and second tension elements are so positioned and wherein said dynamic member is so configured as to collectively and reciprocally move side-to-side when said chain member acts on at least one of said first and second tension elements.

83. (Original) A disc valve system according to claim 82, wherein said reciprocal movement provides for applying interrupted pressure on a each of said chain sides at a time and at substantially regular intervals during the rotating movement of said disc.

84. (Original) A disc valve system according to claim 79, wherein said tension elements are mounted on the outer face of said chain sides, said dynamic member comprising openings near said each longitudinal ends receiving said chain sides therethrough without interfering therewith.

85. (Original) A disc valve system according to claim 79, wherein said dynamic member comprises a generally elliptical shape defining an elliptical opening providing a free working space for said chain member.

86. (Original) A disc valve system according to claim 74, wherein said second sprocket gear is in operative communication with a disc-gear, said disc gear being in operative communication with said disc gear elements.

87. (Original) A disc valve system according to claim 86, wherein said second sprocket gear comprises an aperture for receiving an extending portion from said disc gear.

88. (Original) A disc valve system according to claim 87, wherein said second sprocket gear comprises a resilient member interposed between said second sprocket gear and said extending portion.

89. (Original) A disc valve system according to claim 88, wherein said second sprocket gear comprises a hub for holding said resilient member.

90. (Original) A disc valve system according to claim 89, wherein said resilient member defines an aperture for receiving said extending portion.

91. (Original) A disc valve system according to claim 89, wherein said resilient member comprises a synthetic rubber material.

92. (Original) A disc valve system according to claim 86, wherein said disc-gear comprises a pinion gear and said disc gear elements comprise bevel teeth.

93. (Original) A disc valve system according to claim 74, wherein said at least one of said first and second sprocket gears comprises a resilient member.

94. (Original) A disc valve system according to claim 93, wherein said resilient member of said first sprocket gear is interposed therebetween and said crankshaft.

95. (Original) A disc valve system according to claim 93, wherein said resilient member of said second sprocket gear is interposed therebetween and a disc-gear in communication with said disc-gear elements.

96. (Original) A disc valve system according to claim 73, wherein said movement transfer assembly comprises an elongate member being rotatable about its longitudinal axis, said elongate member comprising first and second elongate member gears at the longitudinal ends thereof, said first and second elongate member gears being in operative communication with said first and second gears respectively.

97. (Original) A disc valve system according to claim 96, wherein said first and second elongate member gears first and second pinion gears respectively, said first and second gears comprising respective bevel teeth, said first and second gear bevel teeth being meshed with said first and second pinion gears respectively.

98. (Original) A disc valve system according to claim 96, wherein said second gear is in operative communication with a disc gear, said disc gear being in operative communication with said disc gear elements.

99. (Original) A disc valve system according to claim 98, wherein said disc gear comprises a disc pinion gear and said disc gear elements comprise gear teeth.

100. (Original) A disc valve system according to claim 97, wherein said disc pinion gear is mounted to said second gear.

101. (Original) A disc valve system according to claim 91, wherein said movement-transfer assembly comprises a plurality of communicating gears.

102. (Original) A piston driven internal combustion engine comprising:

at least one cylinder head manifold comprising exhaust and intake ports;

at least one engine cylinder housing a piston and defining a combustion chamber,

at least one rotating disc mounted between said cylinder head manifold and said engine cylinder, said rotating disc comprising sequencing ports so configured as to be brought into periodic communication with said exhaust and intake ports at cyclic intervals of the rotating movement of said rotating disc thereby providing for said exhaust and intake ports to be brought into periodic communication with said combustion chamber; and

an intermediate seal member mounted within said said engine cylinder at a junction of said rotating disc and said engine cylinder so as to seal said combustion chamber, said intermediate seal member comprising a dynamic seal for contact with said rotating disc and a stationary seal for sealing contact with said engine cylinder;

whereby the rotating movement of said rotating disc sequentially opens and closes each said exhaust and intake ports synergistically with the translational movement of said piston.

Claims 103 – 273 (Canceled)